

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material at the same time or after starting supply of predetermined types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner;

said predetermined types of crystal raw materials are Al and Ga;

said other type of crystal raw material than said predetermined types of crystal raw materials is N; and

a composition of Al being 20% or greater.

2. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 1 wherein said p-type impurity raw material is Mg;

~~said predetermined types of crystal raw materials are the group III elements; and~~

~~other types of crystal raw materials than said predetermined types of crystal raw materials are the group V elements.~~

3. (Previously Presented) An ultraviolet light-emitting device in which a p-type semiconductor is used comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material at the same time or after starting supply of predetermined types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner;

said predetermined types of crystal raw materials are the group II elements; and

other types of crystal raw materials than said predetermined types of crystal raw materials are the group VI elements.

4. (Cancelled)

5. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

a desired number of times for a cycle consisting of:

a first step wherein supply of TMGa, TMAI, and Cp_2Mg is commenced at a first timing, and supply of TMGa, TMAI, and Cp_2Mg is finished at a second timing at which supply of TMGa, TMAI, and Cp_2Mg which has been continued for a predetermined period of time was completed; and

a second step wherein supply of NH_3 is commenced immediately after or after the second timing at which supply of TMGa, TMAI, and Cp_2Mg was completed, and supply of NH_3 is

finished at a third timing at which supply of NH_3 which has been continued for a predetermined period of time was completed;

being repeated, whereby said ultraviolet light-emitting device in which a p-type semiconductor is used is prepared and a composition of Al is 20% or greater.

6. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material and an n-type impurity raw material at close timing with each other at the same time or after starting supply of predetermined plural types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined plural types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner;

said predetermined types of crystal raw materials are Al and Ga;

said other type of crystal raw material than said predetermined types of crystal raw materials is N; and

a composition of Al being 20% or greater.

7. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 6 wherein:

said p-type semiconductor is prepared by starting supply of said p-type impurity raw material in synchronous with commencement of supply for said Al and Ga~~predetermined plural types of crystal raw materials~~; starting supply of said n-type impurity raw material after finishing supply of said p-type impurity raw material; and finishing supply of said n-type impurity before commencement of supply for ~~other types of crystal raw materials than said predetermined plural types of crystal raw materials~~N.

8. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 6 wherein:

said p-type semiconductor is prepared by maintaining a period of time wherein said p-type impurity raw material and said n-type impurity raw material are supplied at the same time, respectively.

9. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in any one of claims 6, 7, and 8 wherein:

said supply of Al and Ga being carried out alternately with respect to that of N in a pulsed manner;

said first impurity raw material is Mg; and

said second impurity raw material is Si;

~~said predetermined plural types of crystal raw materials are the group III elements; and~~

~~said other types of crystal raw materials than said predetermined plural types of crystal raw materials are the group V elements.~~

10. (Previously Presented) An ultraviolet light-emitting device in which a p-type semiconductor is used comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material and an n-type impurity raw material at close timing with each other at the same time or after starting supply of predetermined plural types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined plural types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner;

said predetermined plural types of crystal raw materials are the group II elements; and

said other types of crystal raw materials than said predetermined plural types of crystal raw materials are the group VI elements.

11. (Cancelled)

12. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

a desired number of times for a cycle consisting of:

a first step wherein supply of TMGa, TMAI, and Cp_2Mg is commenced at a first timing, and supply of Cp_2Mg is finished at a second timing at which supply of Cp_2Mg which has been continued for a predetermined period of time was completed;

a second step wherein supply of TESI is commenced immediately after or after the second timing at which supply of Cp_2Mg was finished, and supply of TMGa, TMAI, and TESI is finished at a third timing at which supply of TESI has been continued for a predetermined period of time was completed; and

a third step wherein supply of NH_3 is commenced immediately after or after the third timing at which supply of TMGa, TMAI, and TESI was completed, and supply of NH_3 is finished at a fourth timing at which supply of NH_3 which has been continued for a predetermined period of time was completed;

being repeated, whereby said ultraviolet light-emitting device in which a p-type semiconductor is used is prepared, and a composition of Al is 20% or greater.

13. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in any one of claims 1, 2, 4, 5, 6, 7, 8, and 12 wherein:

a small amount of N is continuously supplied in case of preparing said p-type semiconductor.

14. (Currently Amended) ~~An~~ A deep ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being composed of AlGaN prepared by laminating a crystal layer formed from Ga and Al, and a crystal layer formed from N;

a crystal layer formed from said Ga and Al being doped with Mg and Si; and

Mg and Si being placed closely in said crystal layer formed from Ga and Al at a predetermined ratio;

a composition of Al being 20% or greater.

15. (Previously Presented) An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 3 wherein:

said group III elements are Al and Ga, and said group V element is N;

supply of said Al and Ga are carried out alternately with respect to that of said N in a pulsed manner; and

said p-type impurity raw material is Mg.

16. (Previously Presented) An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 10 wherein:

said group III elements are Al and Ga, and said group V element is N;

supply of said Al and Ga are carried out alternately with respect to that of said N in a pulsed manner; and

said p-type impurity raw material is Mg.